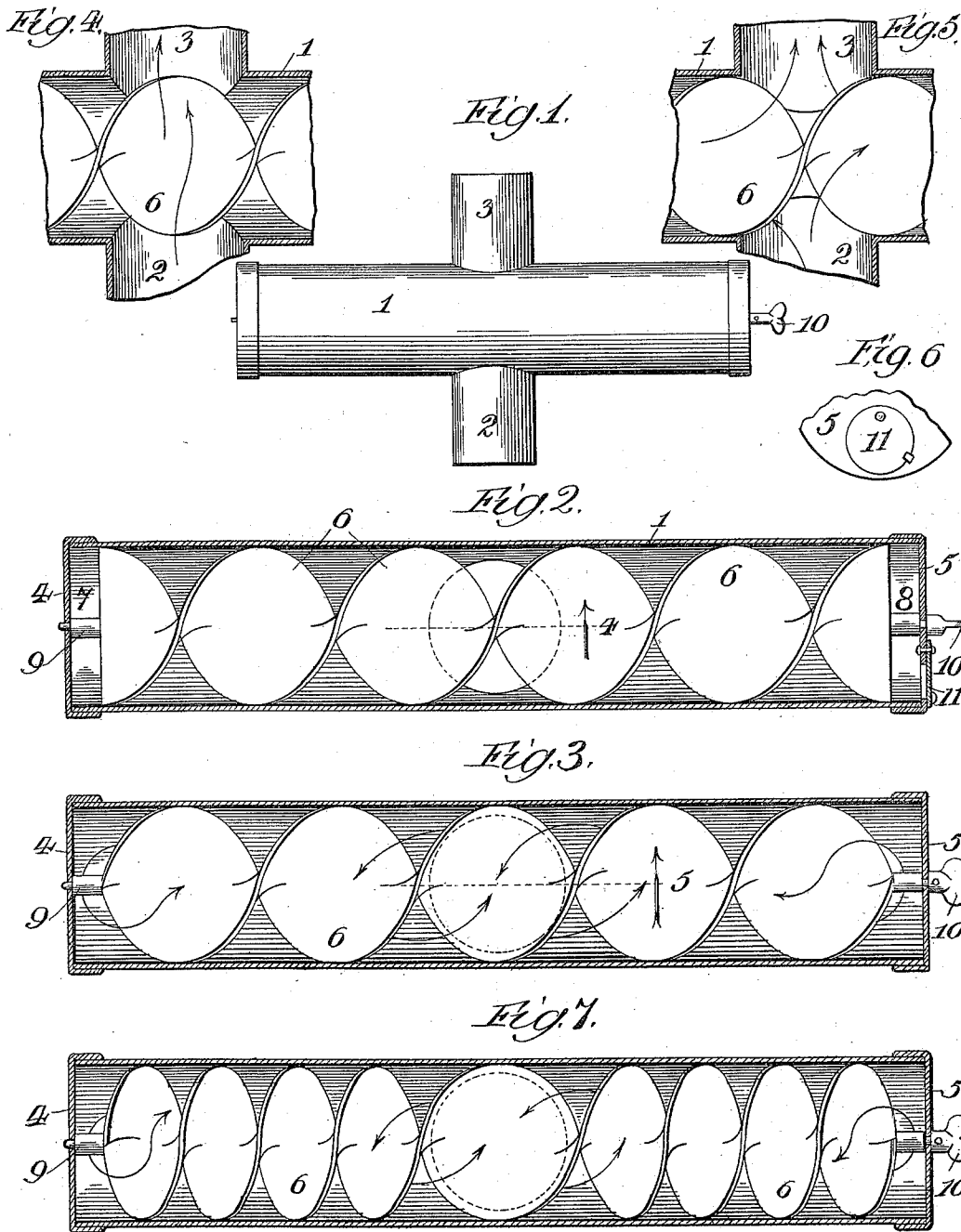


(No Model.)

A. ELMENDORF.
HEATING DEVICE.

No. 600,910.

Patented Mar. 22, 1898.



Witnesses:
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Inventor:
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Att'y.

UNITED STATES PATENT OFFICE.

ALBERT ELMENDORF, OF CHICAGO, ILLINOIS, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, OF TWO-THIRDS TO EVERETT H. REXFORD, OF BLUE ISLAND, ILLINOIS.

HEATING DEVICE.

SPECIFICATION forming part of Letters Patent No. 600,910, dated March 22, 1898.

Application filed December 27, 1897. Serial No. 663,612. (No model.)

To all whom it may concern:

Be it known that I, ALBERT ELMENDORF, residing at Chicago, Cook county, Illinois, have invented certain new and useful Improvements in Heating Devices, of which the following is a specification.

My invention relates to heating devices; and its object is to produce a novel heating-drum or radiator to be used in connection with stovepipes, for instance, and for all analogous purposes. In fact my invention is applicable to and intended to be used in connection with any source of heat in order to utilize and radiate the heat to its fullest extent for usual heating purposes or for any purpose.

In the drawings, Figure 1 is an elevation of my drum connected to a smoke-flue or the like; Fig. 2, an enlarged sectional view of the drum, showing the spiral diaphragm or partition in position to permit of direct draft; Fig. 3, a similar view, but showing the partition turned so as to cause an indirect draft through the drum before the heated gases, &c., can escape from the flue; Figs. 4 and 5, sectional elevations on lines 4 and 5, respectively, of Figs. 2 and 3, respectively; Fig. 6, an end view of a portion of the drum, showing the check-draft; and Fig. 7, a sectional elevation of a drum with a modified form of spiral partition therein.

My radiating device comprises a radiating chamber or drum 1, which may be of any suitable size and proportions. It is preferably made complete, as shown in Fig. 1, in order that it may be easily attached to any ordinary stovepipe, in which case it is provided with the short extensions 2 and 3, forming the inlet and outlet, respectively, for the drum. The inlet and outlet are preferably located opposite each other and at substantially the central longitudinal portion of the drum, as shown in Figs. 1, 4, and 5. However, it will be understood that these extensions are not essential to the drum, but are only preferable and convenient in coupling to a stovepipe or the like.

The drum is closed at its ends, but is preferably provided with end caps or closures 4 and 5, either or both of which may be removable.

Within the drum is arranged a spiral form of diaphragm or partition 6, which extends across the flue-opening, but leaves small spaces or chambers 7 and 8 at the closed ends of the drum. This diaphragm fits the drum, so as to form two spiral chambers on either side of the flue and extending to the end chambers in a spiral path along one side of the spiral and thence back along the reverse side of the spiral to the flue, so as to allow the heated air and gases to escape to the flue.

The diaphragm is preferably rotatable and removable and bears at one end in the cap 4 by means of an extending piece 9. Its opposite end is provided with a handle 10, extending through cap 5, whereby the diaphragm may be turned as desired. This cap being preferably removable, the entire diaphragm may be withdrawn and the drum cleaned by the operation of withdrawing whenever desired.

When the diaphragm is positioned as shown in Figs. 2 and 4, the direct draft is open and the heated air and gases are free to pass directly across the drum, as illustrated by the arrows in Fig. 4, but when the same is turned, as shown in Figs. 3 and 5, this direct passage is interrupted, and the heated gases, &c., are deflected by the diaphragm itself to either side, following the spiral outwardly along one side thereof, and after passing through the end chamber traveling backward along the reverse side of the spiral to the flue. The heated air and gases, &c., are thus given an indirect path through a heating-drum or radiator device, and the diaphragm deflects them against the walls of the drum in both the outward and inward travel, whereby all the heat is absorbed and utilized. The course of the heated gases through this radiating-drum is shown by arrows in Figs. 3 and 5.

It is obvious that the drum or radiator, as well as the diaphragm, may be made of any desired size, and it is also obvious that the diaphragm may have any desired contour so long as the desired object is subserved.

As shown in Figs. 3 and 6, any ordinary and well-known check-draft device 11 may be provided for ventilating purposes when the drum is not used for heating purposes. When the diaphragm is turned to permit of

a direct draft, the check-draft may be opened, and the air of a room may be drawn into the drum and passed out of the flues. It will be understood, however, that this regulated opening is closed when the drum is used as a radiator.

It will be apparent that by slightly turning the diaphragm from the position shown in Fig. 3, so as to partially open the direct draft at the side of the flue next to one branch of the drum, that branch will be cut out as a radiator, but the other branch will continue as a radiator. It will be understood that the drum may be arranged in any desired position with respect to the flue—that is, horizontal, vertical, or otherwise, as may be desired or found expedient; and while I have herein shown a diaphragm in a drum projecting on either side of a flue it will be understood that a single branch from the flue may be used in which the diaphragm extends across the flue-opening and whose turning determines whether the draft is direct through the flue or indirect in a spiral path through a heating-drum.

The object of the end chambers in the drum is to make a continuous path through the drum, so that the heated air and gases after flowing outwardly can double back and flow along the reverse side of the diaphragm or partition. To accomplish this object, I prefer to make the diaphragm shorter than the drum, so as to leave end spaces or chambers; but it is obvious that other expedients might be adopted without necessitating such shortening of the diaphragm. Therefore any manner of making such path continuous is understood to be an equivalent to an "end chamber" and be comprehended under that term as used in the claims.

In Fig. 7 I have shown a modified form of the diaphragm in which the middle spiral is made wider than those at either end. This middle spiral is sufficiently wide so that the direct flue will be entirely interrupted when turned to the proper position. The other spirals are made narrower, so that the spiral path will be lengthened without increasing the length of the drum, to the end that more time and opportunity will be afforded for the absorption and radiation of heat. The operation of this form of construction is the same as the one before described.

While I have herein in the specification and claimsspoken of a "smoke pipe or flue," I wish it understood that I do not limit myself to the use of such pipe, as it is obvious that my invention will work in connection with any suitable source of heat which it is desired to radiate. Such term is therefore used with this understanding and as having this scope and meaning.

By the use of my invention the greatest amount of heat obtainable is utilized and radiated by a means which is simple and reliable and which can be regulated to suit requirements. Furthermore, my device may be ap-

plied to the many different kinds of heating devices, to all kinds of stoves and the like which are now in use and can also be applied to furnaces, stoves, &c., when manufactured.

Although I have described more or less precise forms and details of construction, I do not intend to be understood as limiting myself thereto, as I contemplate changes in form, proportion of parts, and the substitution of equivalents as circumstances may suggest or render expedient. Furthermore, I do not limit myself to the application shown for illustration of my invention, as I contemplate using my invention wherever applicable.

I do not herein claim, broadly, the use of a spiral diaphragm or partition in a radiating-drum whereby the heated air and gases deflected into such drum are caused to follow a spiral path to the end of the drum and back, inasmuch as I have made such invention the subject of an application heretofore filed by me on September 27, 1897, Serial No. 653,139.

I claim—

1. In a heating device, the combination of a flue or pipe, a branch pipe therefrom closed at its outer end and a spiral diaphragm located therein and extending across the flue, whereby an indirect draft or passage is provided which runs spirally to the closed end of the branch pipe and then back again to the flue along the reverse side of the spiral diaphragm.

2. In a heating device, the combination of a flue or pipe, a branch pipe therefrom closed at the outer end and a movable spiral diaphragm located therein and extending across the heat-flue, the diaphragm in one position permitting a direct draft but when in another position causing an indirect draft along one side of the diaphragm in a spiral path to the closed end of the branch pipe and then along the reverse side of the diaphragm in a spiral path to the flue.

3. In a heating device, the combination of a flue or pipe, a branch pipe or radiating-drum extending across said flue and communicating therewith, such drum being closed at its ends, and a rotatable spiral partition located in said drum and forming chambers at the ends of the drums, the partition extending across the flue, whereby the partition in one position permits direct draft but in another position interrupts the same and deflects the heated air, gases, &c., in either direction along a spiral path to the end chambers of the drum along one side of the partition and then along the reverse side of the partition to the flue.

4. In a heating device, the combination of a flue or conduit, a communicating radiating-drum extending thereacross and having closed ends, a rotatable and removable spiral partition located in said drum but slightly shorter than the drum whereby end chambers are formed, and a removable cap or closure for one end of the drum whereby the partition may be removed, the partition in one position permitting a direct draft through the flue but in an-

other position, deflecting the heated air and gases into the drum along a spiral path to the end chambers and then back again to the flue.

5 5. In a heating device, the combination of a flue or pipe, a communicating radiating-drum extending thereacross and having closed ends, and a spiral partition located in said drum, the width of that spiral directly across
10 the flue being greater than the others.

6. In a heating device, the combination of a flue for heated air and gases, a communicating radiating-drum extending thereacross and having closed ends, and a spiral partition in
15 said drum, the width of the middle spiral thereof being sufficient to close the direct flue but the width of spirals at either side of such middle spiral being narrower whereby the spiral path is lengthened through the drum.

20 7. A heat-radiating device, comprising a drum closed at its ends and having an inlet and outlet oppositely located at its central longitudinal portion for the passage of heated air and gases, and a spiral diaphragm therein
25 which in one position allows the heated air

and gases to pass directly across the drum and in another position interrupts such direct passage and deflects the same as they enter the inlet in either direction along a spiral path on one side of the partition to the ends 30 of the drum and thence back along the reverse side of the partition to the outlet.

8. In a heating device, the combination of a flue a communicating radiating-drum closed at its ends, a rotatable spiral partition located in such drum and extending across the flue and a regulated opening in the end of the drum, whereby when such opening is closed and the partition turned to close the direct draft through the flue, an indirect draft is
35 provided through the drum to utilize and radiate the heat from the flue and whereby when such opening is closed and the partition turned to open the direct draft, air is drawn into the drum for ventilating purposes. 40

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